MISHEGUK MOUNTAIN

NORTHWESTERN BROOKS RANGE

SEQUENCES (2)

IPNAVIK RIVER

AUTOCHTHONOUS

Lower Jurassic and older, probably not exposed in NPR-A

thrust fault

thrust fault

Sandstone, siltstone, and shale

KELLY RIVER SEQUENCE(3)

SEQUENCE (6)

EQUENCE (5)

SEQUENCE (4)

ROCKS ?

INTRODUCTION

The accompanying geologic map and description of rock units represent an interpretation of the geology in the southern part of NPR-A based upon the publications of Tailleur and others, 1966, Snelson and others, 1968, and Martin, 1970. The south edge of NPR-A (Delong and Endicott Mountains) consists of

Ine south edge of NPK-A (Delong and Endicott Mountains) consists or generally coeval rock assemblages of slightly different facies which are believed to have been superimposed by large-scale horizontal thrust faults. Movement of the hanging wall relative to the footwall side of thrust faults has been from south to north, and it is probable that a distance of more than 160 km would be required to unstack the thrust plates to their original positions. Major foreshortening occurred in the latest Jurassic to middle Cretaceous. Numerous open folds and high angle faults affected the rocks after the thrusting ended.

Rock units have been grouped into discreet thrust sequences. Five of the sequences, the north central Brooks Range, northwestern Brooks Range, Kelly River, Ipnavik River, and Nuka Ridge thrust sequences, have rocks ranging in age from Cretaceous to Mississippian or Devonian. Rocks of the Misheguk Mountain thrust sequence have less certain age, but must be Jurassic or older. The relationship between the north central Brooks Range sequence and the northwestern Brooks Range sequences is uncertain; however, apparent gradational facies change in Mississippian rocks and similar structural position of these sequences suggests that they are not separated by major thrust faults. The northwestern Brooks Range thrust sequences are not well enough understood to be separated on the map, but discreet sequences may be mappable using shaley versus cherty Mississippian rocks. The diagram below is a schematic cross-section in southern NPR-A showing the relative stacking positions and spatial (east-west) distribution of the 6 major thrust plates represented on the map.

REFERENCES

Chapman, R.M., Detterman, R.L., and Mangus, M.D., 1964, Geology of the Killik-Etivluk Rivers region, Alaska: U.S. Geol. Survey Prof. Paper 303-F, p. 325-407

Brosgė, W. P., and Reiser, H. N., 1951, Selected sections of Lisburne Limestone, Brooks Range, Alaska: U.S. Geol. Survey Navy Oil Unit Rept. No. 34, 18 p.

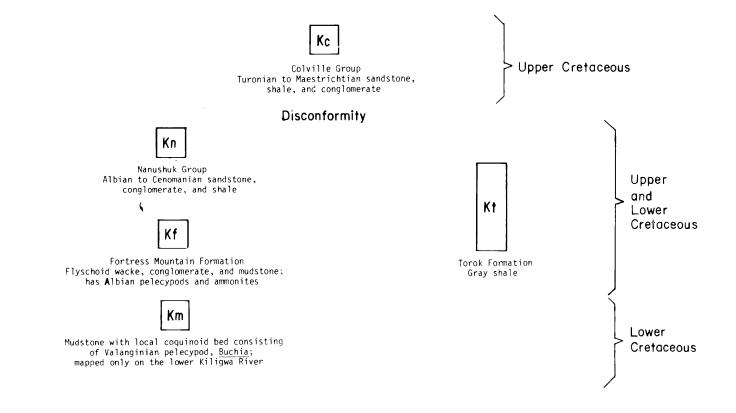
the rocks after the thrusting ended

DESCRIPTION OF ROCK UNITS

(FROM MAYFIELD AND OTHERS, 1978)

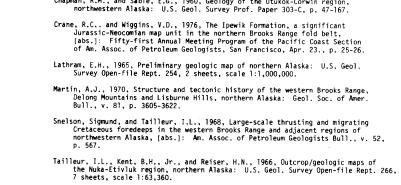
SURFICIAL DEPOSITS





ALLOCHTHONOUS ROCKS

AUTOCHTHONOUS ROCKS



Tailleur, I.L., and Brosgé, W.P., 1970, Tectonic History of Northern Alaska, in W.L. Adkison and M.M. Brosgé, eds., Proceedings of the geological seminar on the North Slope of Alaska: Los Angeles, Pacific Sec. Am. Assoc. Petroleum Geologists, p. El-El9.

q pe

Pillow basalt and diabase, ioca'

chert and shale

and plagioclase with variable amount

of hornblende, orthopyroxene, and

not been edited or reviewed for conformity with Geological Survey

Jurassic

Jurassic

Older

Older

NORTH CENTRAL BROOKS RANGE THRUST SEQUENCE I NORTHWESTERN BROOKS RANGE THRUST SEQUENCES 2 Disconformity ? Disconformity ? Lower Lower Cretaceous Flyschoid wacke, mudstone, and con-Flyschoid mudstone and subordinate Cretaceous acke: has Neocomian pelecypod, Buchia stone. Has Lower Cretaceous and Upper Upper named Ipewik Formation Jurassic Okpikruak Formation and informally Disconformity ? Disconformity? dbı **Jurassic** Diabase and basalt, occurs mainly as dikes and sills Jurassic Gray red, and green chert and shale with few fine-grained gray limestone beds in Triassic upper third of unit. Has Triassic pele-Permian cypod, <u>Monotis</u>, in upper part; includes informally named Blankenship Formation and Shublik and Siksikpuk Formations Gray, red, and green chert and shale with few fine-grained gray limestone beds Permian and Triassic pelecypod, Monotis, in upper part. Includes Shublik and Siksikpuk Formations; locally may include Lower Jurassic oil shale and chert Triassic Triassic to Mississippian rocks undifferentiated, includes gray chert and shale (RP2), and black chert and shale Mississippian (Ml₂) in structurally complex terranes KPi Lower Lower Cretaceous Lower Cretaceous to Permian rocks un-Cretaceous differentiated; includes mudstone and wacke (Ki) and chert and shale (JPi) ir Permian differentiated; includes wacke and mudstructurally complex terranes Permian in structurally complex terranes KM2 Lower Lower Cretaceous Lower Cretaceous to Mississippian rocks Cretaceous Lower Cretaceous to Mississippian rocks undifferentiated; includes mudstone (Ki) chert and shale (JP₁), and limestone (Ml₁) in structurally complex terranes undifferentiated; includes wacke and Mississippian mudstone (K_2) , chert and shale (RP_2) , Mississippian and black chert and shale (Mla) in structurally complex terranes MI2 MV Lisburne Group Limestone and dolomite with local Lisburne Group Mississippian Ml2 - carbonaceous black chert and shale layers; abundant crinoids, corals, with few dark limestone beds; brachiopods, and foraminifera; lateral rhyolitic tuffs and flows at equivalent to Wachsmuth and Alapah Formations Drenchwater Creek Mississippian MKS 3 MK Aks-siltstone, shale, and sandstone; Mk-black shale with few intercalated beds of orange or brown weathering Kanayut Conglomerate glomerate and clean white sandstone Mississippian Upper Devonian Dss

EAST

thrust fault

thrust fault

NORTH CENTRAL

BROOKS RANGE

SEQUENCE (1)

KELLY RIVER THRUST SEQUENCE 3 IPNAVIK RIVER THRUST SEQUENCE 4 NUKA RIDGE THRUST SEQUENCE 5 MISHEGUK MOUNTAIN THRUST SEQUENCE 6 Кз K4 Lower Lower Lower Cretaceous Flyschoid wacke and mudstone with lo-Cretaceous Cretaceous Flyschoid wacke and mudstone with Flyschoid wacke and lesser mudstone: cal conglomerate; has Neocomian pele has Neocomian pelecypod, <u>Buchia;</u> includes Okpikruak Formation Okpikruak Formation Unconformity ? Disconformity ? Disconformity ? db4 Jurassic Diabase and basalt, occurs mainly as sills and dikes TRP3 ₹P5 Triassic TRP4 Triassic Triassic Gray and red chert and shale, has few limestone beds and Triassic pelecypod, Permian Permian Well-bedded gray and red chert with minor shale; has Triassic pelecypod, diabase sills; subordinate shale Permian Monotis, in upper part; includes Shublik and Siksikpuk Formations Monotis, in upper part KP4 Lower Lower Cretaceous Cretaceous Lower Cretaceous to Permian rocks differentiated; includes wacke and mudstone (K_4), diabase (db_4) and cher Permian mudstone (Ks), and gray chert (R Ps) (RP4) in structurally complex Permian KM4 Cretaceous Cretaceous Lower Cretaceous to Mississippian rocks undifferentiated; includes gray, red, and green chert (RP4), diabase (db4), undifferentiated; includes wacke and mudstone (Ks), chert (RPs), and Nuka Mississippian Mississippian Formation (PMn) in structurally

and dolomite; has brachiopods and

Devonian

Mississippian

MI3

Lisburne Group

Crinoidal limestone with local black

chert nodules and beds, and sandy lime

stone with local sandstone and shale.

Includes Tupik, Kogruk, and Utukok